Exploring Origins

Telling Your Story to the Space Agency

TEACHER GUIDE

BACKGROUND INFORMATION

This culminating activity involves the students in the design and proposal of a new Space Agency-funded mission to improve current scientific understanding about the origins of our solar system. The students' proposed mission must build on heritage, both scientific and technological.

The terminology "Request for Proposal" (RFP) is not used in all funding agencies. NASA creates "Announcements of Opportunities" that serve the same purpose.

This activity provides an opportunity for the teacher or teachers of this unit to make specific skill and knowledge assessments.

STANDARDS ADDRESSED

Grades K-4
Science
Science and Technology
Language Arts
Technology
Life Skills
Thinking and Reasoning
Working With Others

Grades 5-8
Science
Science and Technology
Science in Personal and Social Perspectives
    Science and Technology in Society

Language Arts
Technology
Life Skills
Thinking and Reasoning
Working With Others

Grades 9-12
Science
Science and Technology
Science in Personal and Social Perspectives

Language Arts
Technology
Life Skills
Life Work
Thinking and Reasoning
Working With Others

MATERIALS

Questions posted for Activity 2
For each student:
- Summary sheets for each technical area (developed by students in previous activity)
- Request For Proposals
- Scoring Rubric for Mission Proposals

PROCEDURE

1. *Tell students:*

You are now in groups containing (at least) one expert on each of the technical areas we have investigated. You will use your groups' combined expertise to respond to a Space Agency **Request for Proposals (RFP).** An RFP is the way in which a funding agency lets people know what kinds of projects they are willing to pay for. Many researchers have great ideas for research projects, but they can only carry them out if they have adequate funds.

The Space Agency is searching for missions to fund within the next 10 years after the Genesis mission. These missions will provide additional information to support or refute theories about the origins of the solar system. I will give you a copy of the RFP and the scoring rubric by which the Space Agency will decide which proposals to fund.

Your group will first decide which of the posted questions you will address with your research project. You will then design a mission to attempt to answer the question. This mission must be unique, meaning that the goal of the mission and the data that is collected are not exactly the same as in any previous NASA missions. You must clearly explain the question you are trying to answer, describe how this mission builds on previous NASA missions, and outline the proposed mission's feasibility.

Remember that all scientists work in a social setting, within a larger environment. You will need to identify the environment in which your project will take place, and decide how to gain the public's support for your work.

Extend the Angle
- Students may be interested in the proposal writing process. Encourage them to read about opportunities for funding from a variety of sources.
- To look at this process from a different perspective, students may want to write an RFP for a sun-Earth connection research project. They will need to set criteria for successful applicants.
- A helpful resource Web site is: http://umbra.nascom.nasa.gov/spd/sec_nra_links.html "Sun Earth Connection NASA Research Announcement links."

2. Distribute the RFP and the Scoring Rubric. Discuss the criteria for evaluation with the students. Tell students that you will be acting as the representative from the Space Agency and will relay information about their proposed projects to the committee that will decide which proposals will be funded.

3. Have the groups give their presentations. Encourage the use of audiovisuals and technology to support the presentations. Remind students that most project proposal presentations done by scientists are oral presentations given with PowerPoint or some other type of presentation software.

4. Evaluate the groups based on the attached rubric. When using the rubric for evaluation, take the developmental level of the child into account, especially in the category addressing the feasibility of the mission. Younger students might not be able to appreciate technical constraints as well as older students can.

Assessment Options

- Grades may be assigned for specific portions of the rubric that have been emphasized during prior instruction.
- Students may self-assess and compare their ratings to those given by the audience. Discuss areas of discrepancy.

STUDENT AND TEACHER RESOURCES

http://www.urich.edu/~grants/sucpsl.htm
Hints for successful proposal writing, with specific information about proposals to NSF and NIH.

http://www.evansassoc.com/lib/Grantsam.htm
A sample grant proposal in the area of technology education.

http://www.sharplink.com/books/bookmark4.htm
"Some Things to Think About When Writing a Grant" includes information gathering and other important initial steps.

http://umbra.nascom.nasa.gov/spd/sec_nra_links.html
"Sun Earth Connection NASA Research Announcement links."

http://umbra.nascom.nasa.gov/spd/sec/app_b2.html
"Instructions for Responding to NASA Research Announcements."

http://www.ed.gov/pubs/KnowAbtGrants/
The U.S. Department of Education tutorial about their grants process.

http://www.law.vill.edu/Fed-Agency/fedwebloc.html
This Federal Locator lists all federal agencies. Within their homepages look for funding/grants.

http://www.nptimes.com/main/nonprofit.html
Non-Profit Links on the Internet.

http://www.philanthropy.com/
Chronicle of Philanthropy.

Space Agency Request for Proposals

Proposal Request Guidelines

The Space Agency is seeking proposals for missions that will gather data about the origins of the solar system that we inhabit. This data may come from any object in the solar system and should add to the current knowledge about the beginnings of the solar system.

Successful awardees will present a proposal that demonstrates the following:

1. **Name of mission**.

2. **Purpose of mission**. Indicate what data will be collected and justify its usefulness to our understanding of the origins of the solar system.

3. **Technical Feasibility.** Indicate what current and available technology will be used in your mission and/or which types of new technology will have to be developed. Your proposal will be evaluated on its technical feasibility, including how realistic your plans are.

4. **Historical Development.** Outline at least three previous NASA missions or activities that provide a technical foundation for your mission. You must clearly indicate why you chose these missions as technical foundations for your program.

5. **Uniqueness.** Explain why your program is unique compared to those that NASA has previously supported.

6. **Partner Agency Support.** List the partner agencies you expect to be working with. Outline each partner's role in the total project.

7. **Public Support.** Explain the stance your project takes. Discuss several ways to gain public support for your mission.

This information must be submitted in a written document, and should be presented in another format as well.

SCORING RUBRIC FOR MISSION PROPOSALS

	3	2	1	0
Name	Uses catchy acronym to name mission.	Descriptive mission name.	Mission name not descriptive.	Does not name mission.
Purpose	Data to be collected is completely described.	Data to be collected is partially described.	Data to be collected is described but incompletely understood.	Data to be collected is not indicated.
	Usefulness of data is justified with two or more reasons.	Usefulness of data is justified with one reason.	Usefulness of data is not justified.	Usefulness of data is not mentioned.
Technical Feasibility	Technology is described in detail.	Technology is discussed, some descriptions present.	Technology is mentioned with no descriptions.	Technology is not mentioned.
	Detailed technical heritage and/or detailed description of proposed development sequence.	All technology is currently available or may be realistically developed.	Most of the technology mentioned is currently available or may be developed	Technology is not realistic.
Historical Development	Outlines 3 or more previous missions.	Outlines 2 previous missions.	Outlines 1 previous mission.	No previous missions mentioned.
	Justifies inclusion of 3 missions' technology.	Justifies inclusion of 2 missions' technology.	Justifies inclusion of 1 mission's technology.	No justifications present.
Uniqueness	Explains nature of mission, discussing both similarities and differences, to show amount of uniqueness.	Explains nature of mission, showing uniqueness through discussion of differences.	Explains nature of mission, but it is not unique.	Does not address uniqueness.
Partner Agency Support	Logical partner agencies identified, logical roles assigned, and interrelationships of efforts clarified.	Logical partner agencies identified, with logical roles assigned.	Partner agencies identified, but roles not given.	No partner agencies identified.
Public Support	Thoroughly and respectfully describes relationship between project stance and environment.	Describes project stance taken by mission.	Describes cultural environment of mission.	Does not describe project stance or environment.
	Unique, persuasive methods for obtaining public support described which derive from the cultural stance.	Selects common methods for obtaining public support which derive from the cultural stance.	Describes common generic methods for obtaining public support.	Does not identify methods for obtaining public support.